

Comparing and Analyzing the Physical and Functional Concerns of Post Breast Cancer Surgery Patients Who Received Physical Therapy for Lymphedema After Surgery to Those Who Did Not Receive Physical Therapy After Surgery

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ABSTRACT

Objective: This pilot research project examined the physical and functional concerns of patients who had breast cancer surgery followed by receiving skilled physical therapy or lymphedema therapy services for more than or less than three months.

Methods: This research study utilized the Qualtrics system to create a survey for the participants to complete. After completing the survey, the researchers divided the participants into two groups. The researchers analyzed the data using SPSS to run independent sample t-tests.

Results: The study results show no significant difference in limb size and self-care activities between the two groups who received physical therapy.

Keywords: Lymphedema, Breast Cancer, Physical Therapy, Function, Treatment

Introduction

Breast cancer affects one out of eight women in the United States [1]. In 2022, 287,850 were expected to be diagnosed with breast cancer [1]. A person diagnosed with breast cancer encounters many physical and functional challenges following breast cancer surgery and treatment [2]. For example, patients diagnosed with breast cancer significantly suffer from pain, decreased functional range of motion, decreased muscle strength, and decreased muscle endurance in the thorax, shoulder, and arm. These impairments have a substantial impact on the quality of life and functional mobility of affected persons [2]. In addition, while chronic discomfort in the upper extremities has been recorded, 60% of patients also experienced inflammation and tissue adhesion as a result of breast cancer treatment [2]. Moreover, lymphedema is a typical side effect that has been shown to affect more than one in five patients with breast cancer [3]. Lymphedema is swelling caused by a buildup of protein-rich lymph fluid in the thorax or extremities that limits functional performance [4].

Review of Literature

Complex decongestive physical therapy is the gold standard for treating lymphedema [5]. Complex decongestive physical therapy includes manual lymphatic drainage therapy, skincare, therapeutic exercises, and compression [5]. The Faculty of Health Sciences at Bezmialem Vakif University examined the effectiveness of complex decongestive physical therapy for breast cancer surgery patients with reduced range of motion and diminished strength [5]. Sixty-eight patients with lymphedema caused by breast cancer participated in the study. The patients underwent intensive decongestive physical therapy for six weeks. In addition, 30 minutes of manual lymphatic drainage were performed twice a week. Compression sleeves were to be worn by participants for six weeks, twelve hours per day, seven days per week. Finally, shoulder flexion, extension, abduction, and internal and external rotation exercises were performed twice daily, ten times each session. The study's results confirmed the hypothesis that complex decongestive physical therapy, a type of manual therapy, can boost functional mobility, decrease lymphedema, and enhance the quality of life in post-breast cancer surgery patients [5].

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Another study examined the benefits of manual therapy for post-breast cancer surgery patients, including tissue mobilization, superficial and deep muscle massage, myofascial release, acupressure of trigger points, and manual traction [6]. By releasing fibrotic tissue in the muscle and giving patients who have undergone breast cancer surgery analgesia for body pain, these manual therapy techniques have been found to alleviate chronic musculoskeletal pain [6]. Additionally, research demonstrates that manual therapy for patients recovering from breast cancer surgery is a financially advantageous and secure intervention [6].

In a different study, the Women's Integrated HealthCare Center's Division of Physical Therapy compared the efficacy of manual therapy paired with upper-limb exercises versus exercises alone for shoulder rehabilitation following breast cancer surgery [7]. The study found that the range of motion in the upper extremities, mainly the range of motion in the shoulders, was significantly reduced in individuals who underwent axillary lymph node dissection after breast cancer [7]. The study has 131 individuals who were divided into two groups. Both manual treatment and upper-limb exercises were given to those in Group 1, while neither therapy was given to those in Group 2. In this study, shoulder abduction, external rotation, and forward flexion were the upper limb exercises used in physical therapy to promote shoulder mobility and range of motion. This study yielded different results than the earlier studies mentioned. However, the upper extremities, shoulder range of motion, and functional mobility were not significantly different [7].

Physical therapy has been shown to improve daily activities, reduce lymphedema-affected limb volumes, improve arm functions, and boost the quality of life for patients recovering from breast cancer treatment and surgery [8]. For long-lasting effects from manual treatment, physical therapists might also suggest that patients add self-manual lymphatic drainage, strengthening exercises, and stretching exercises into their home exercise regimens [8]. The existing data shows that manual therapy is an effective treatment intervention used to improve physical function and global well-being and reduce cancer pain and functional impairments in post-breast cancer surgery patients [9]. Researchers suggest that early identification and referral to physical therapy before breast cancer surgery are essential to address the adverse side effects and issues that impact patients with breast cancer [9]. The earlier the lymphedema, decreased range of motion, and pain are identified and addressed, the greater the effectiveness of manual therapy [9].

Based on the existing data as it pertains to the effectiveness of manual therapy and lymphedema therapy and their effects on post-breast cancer surgery patients, this pilot research project wanted to examine the physical and functional concerns of patients who had breast cancer surgery followed by receiving skilled physical therapy or lymphedema therapy services greater than or less than three months.

Methodology

This study began with a review of current literature to establish the research questions driving the study. The aim of the study was established before moving further with the study. This study aimed to analyze the physical and functional concerns

of post-breast cancer surgery patients. To be included in this study, participants were required to meet the inclusion criteria. The inclusion criteria were previous diagnosis of breast cancer, surgery as a treatment for breast cancer, completion of the informed consent form, and participation in the survey.

This research study utilized the Qualtrics system provided by Alabama State University to create a survey for the participants to complete. The survey consisted of the informed consent form, demographic questions, and lymphedema life impact scale version 2 sections 1 and 3. The demographic questions consisted of sex, race, age group, type of surgery, if the participant received physical therapy following surgery, how long ago their surgery was, how long ago they received physical therapy, the amount of time they received physical therapy, and if they developed lymphedema.

The questions included from the Lymphedema Life Impact Scale Version 2 - section 1 were: the amount of pain, the amount of limb heaviness, the size of the limb, and effects on movement and strength all related to lymphedema symptoms in the week previous to them completing the survey.¹⁰ The questions included from the Lymphedema Life Impact Scale Version 2 - Section 3 were: ability to perform self-care activities, ability to perform routine home activities, ability to perform work-related activities, ability to perform preferred leisure activities, proper fit of clothing/shoes, and effects on sleep all related to lymphedema symptoms in the past week [10].

Participants were recruited for this study using fliers. The disbursement of the fliers included: doctor's offices, physical therapy clinics, Alabama State University campus, and social media platforms. Data was collected via survey participation as mentioned above. The data remained confidential and was only accessed by the research team and advisor. After three months, the survey was changed to inactive to prevent any further participation during the data analysis portion of the study. Following the completion of the survey time frame, the participants were split into 2 groups: received less than 3 months of physical therapy and received more than 3 months of physical therapy. The data was analyzed using SPSS to run independent sample t-tests comparing the results of each question of the survey between the 2 groups.

Data analysis was completed using SPSS. The SPSS software was provided by the Alabama State University Department of Physical Therapy and was accessed in the John L. Buskey computer lab. An independent sample t-test was used to analyze the data of the completed surveys.

The participants were divided into two groups: received less than three months of physical therapy and received more than three months of physical therapy. An independent sample t-test was completed for each question of the Lymphedema Life Impact Scale Version 2 that was included in the survey. The independent sample t-test was used to compare the results of the two study groups. Following data analysis using SPSS, the outputs of each independent sample t-test were reviewed and assessed using Brian C. Cronk's "How to Use SPSS" to ensure understanding of the numerical data.

Results

Based on the Lymphedema Life Impact Scale, two independent t-tests were used to correlate the limb size and level of self-care in participants who received varied lengths of physical therapy treatment. The independent-samples t-test that calculated the mean score of limb size in participants who received less than three months of physical therapy to the mean score of limb size in participants who received three or more months of physical therapy following breast cancer surgery showed no significant difference ($t(5) = 1.250, p > .05$). The mean of the participants' limb size who received three or more months of physical therapy ($M = .5000, sd = .70711$) was not significantly different from the mean of participants' limb size who received less than three months of PT ($M = 1.4000, sd = .89443$).

The independent-samples t-test that calculated the mean score of self-care in participants who received less than three months of physical therapy to the mean score of self-care in participants who received three or more months of physical therapy following breast cancer surgery also showed no significant difference ($t(3) = 1.039, p > .05$). The mean of the participants' self-care activities receiving three or more months of physical therapy ($M = .0000, sd=0$) was not significantly different from participants' self-care activities who received less than three months of physical therapy ($M = 1.5000, sd = 1.29099$).

Discussion and Conclusion

The number of breast cancer patients is on the rise daily, correlating with an increasing chance of developing lymphedema and functional limitations as a result of breast cancer surgery. Therefore, promoting, educating, and understanding the importance of the potential effects of lymphedema can increase the quality of life in breast cancer survivors. However, this study's research findings yielded no significant difference between limb size and self-care activities of both groups who received physical therapy. The small sample may have contributed to a decrease in the lack of this study's significance. A larger sample size may be advantageous to further research going forward to improve generalizability. A foundation has been established for future studies to build upon.

Limitations

One major limitation of this study was COVID-19. Several restrictions and protocols were set in place delaying data collection and interaction with subjects. This study was limited to 13 subjects. A larger sample size, location, and time frame of this study would have presented an increase in data quality and accuracy.

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